

of which it would permanently preserve the form. Nathorst replies that the decay would follow no such downward course; that it would commence in the softest tissues, wherever they were; and that in such objects as *Bilobites* and *Cruziana*, which Saporita believed to be cellular and fistular objects, whilst their outer surfaces were sufficiently hard and resisting to impress their sculpturings upon the underlying mud, the decay would commence in their interior, with the result, in each instance, not of destroying all traces of the upper surface whilst the lower one was preserved, but that both surfaces of the flattened organism would be preserved, as is the case with the Carboniferous *Sigillaria* and *Lepidodendra*. Once thus flattened, the organism would no longer be capable of producing the deeply concave groove in the clay to which the specimens in bold demi-relief have been due.

This part of the controversy furnishes Nathorst with another argument. However much compressed, embedded fragments of vegetable matter almost invariably retain some traces of their primitive carbonaceous constituents, however thin the film thus preserved may be. As in the case of many of the Monte Bolca Fucoids, this may be no more than a faint brownish stain on the surface of the stone; whereas such stains, suggestive of the former permanent presence of organic matter, are almost invariably, if not wholly, absent from the pseudo-Fucoids.

In his new memoir M. Nathorst then proceeds to examine in detail the claims of several well-known genera to rank as members of the vegetable kingdom. I must refer such as are interested in the details of this controversy to the original memoir of the Swedish palæontologist. I would only observe that, whilst M. Nathorst denies the accuracy of some of M. Saporita's statements as to the facts in certain instances, in others on which the two palæontologists are agreed he shows that the acknowledged facts are capable of such explanations as lead to conclusions diametrically opposed to those arrived at by M. Saporita.

One of the most important features of M. Nathorst's new memoir is seen in his illustrations. He has invented some simple instruments, by rolling which over some plastic materials he produces impressions, casts of which recall most strikingly the objects known by the generic titles of *Cruziana* and *Harlania*.

Whatever ultimate decisions may be arrived at respecting these debated objects, I am compelled to arrive at a conclusion which I have already announced on more than one previous occasion. When it is possible for two observers so experienced as are M. Nathorst and M. Saporita to study the same objects and to arrive at such opposite determinations as to their organic or inorganic character, we must at least conclude that objects capable of receiving such contradictory explanations can have no value when we are considering the evolution of the vegetable kingdom. The evidences of the witnesses in such a controversy must be clear in their testimony and indisputable as to their antecedents.

Manchester, August 11

W. C. WILLIAMSON

### NOTES

A TELEGRAM from Grenada, August 16, states that the British observing party for the eclipse of the sun on the 29th inst. has arrived there, and has divided into two. Messrs. Lockyer, Turner, Perry, and Maunder are going to Green Island and Grenville Bay, on the east side of Grenada, and to Carriacou, a small island to the north. Messrs. Darwin, Thorpe, Schuster, and Lawrence will take up their station at Prickly Point, Hog Island.

THE seventeenth meeting of the German Anthropological Society was formally opened on the 11th inst. at Stettin. The gathering is described as a very representative and distinguished one.

THE Yorkshire Naturalists' Union fungus foray will take place on Thursday, September 30. On the following day there will be an exhibition of the specimens in the Leeds Museum, kindly lent for the purpose; and in the evening the usual dinner. Several distinguished mycologists have promised to be present, and no effort is being spared on the part of the officials to make it a success.

LORD DUFFERIN is, it is stated, about to address a memorandum to the Provincial Governments of India regarding technical education, pointing out where the present system fails, suggesting remedies, advising the adoption of a more practical system, and inviting opinions from the Provincial Governments on the whole subject.

WE have received the Smithsonian reports on the progress of physics and mineralogy for the past year. The former is by Prof. Barker, the latter by Prof. E. S. Dana. Physics is treated under the heads general, mechanics (with the sub-titles solids, liquids, gases), acoustics, heat (sub-titles production of heat, expansion and change of state, conduction and radiation, specific heat), light (production and velocity, reflection and refraction, dispersion and colour, interference and polarisation), electricity (magnetism, electric generators, electrical units and measurements, electric spark and electric light), obituary, and bibliography. Mineralogy, similarly, is treated under the heads general, crystallography and physical mineralogy, chemical mineralogy, new mineral localities, new minerals, papers on mineral species, bibliography, and obituary.

THE Smithsonian Report for the past year contains a most interesting paper on the "Volcanic Eruptions and Earthquakes in Iceland within Historic Times," translated and condensed from the work of Th. Thoroddsen, by Mr. George Boehmer. The original work appears to be one of enormous research and thoroughness. Mr. Boehmer divides his subject into early accounts, position of the active volcanoes, of which there are eight groups, with a sketch of each, chronological list of volcanic eruptions and earthquakes in Iceland, and finally an extensive bibliography of the volcanoes, earthquakes, and geysers of Iceland.

THREE severe shocks of earthquake occurred at Malta, the first at 8.30 p.m. on August 14, the second at 3.45 a.m. on August 15, and the third at noonday. Three fresh shocks were felt on the evening of the 17th, the first at 5.45, the second at 6.20, and the third at 7.45. They were not so violent as those experienced on Saturday and Sunday, and no damage is reported.

MR. H. B. GUPPY is completing his work on the Solomon Islands and their natives, which will shortly be ready for the press. The work will refer chiefly to the anthropology and geology of this region. It will also treat of the botany, natural history, meteorology, and general resources of these islands, and there will be appended an account of the original discovery of the group as related in the British Museum manuscript of Gallego's "Journal." The chief value of Mr. Guppy's observations will lie in the circumstance that his collections have been examined by the leading authorities on the subjects to which they relate. He hopes to illustrate the work from his own photographs.

WITH reference to Mr. Verbeek's investigations into the Krakatã eruption, which were noticed in NATURE, vol. xxxiii. p. 560, we have received a letter from Herr Retgers, Mining Engineer in Samarang, stating (as indeed Mr. Verbeek had already stated in his work) that the whole of the mineralogical investigations into the composition of the volcanic ashes then thrown out were carried out by him.

THE Committee of the Liverpool Naturalists' Field Club begin their report for the past year by observing that for twenty-five years past statistics have been exhausted and lectures also, so far as their usefulness is concerned. "Your Committee, therefore, on this occasion, will spare you figures and forbear admonition, contenting themselves with a bare record of the year's proceedings, and leaving members to draw their own conclusions as to what has been and what might have been done." With such a lugubrious commencement, one might expect that the affairs of the Club were in a "parlous" state, but this is far from being the case. One complaint is that the attendance at the excursions was not satisfactory, and therefore either the number will have to be cut down, or the distances travelled be less. The average attendance was about 60,—which many similar societies would consider an uncommonly good one, especially when it is remembered that some of the journeys were rather long. The Treasurer has the handsome balance of nearly 90*l.* in his hands; the President, the Rev. H. Higgins, delivered an excellent address on "Calcareous Sea-Weeds: an Essay in Comparative Phytology;" the lists of interesting plants noticed on some of the excursions show that the members who did go kept their eyes open; the competition for the prizes appears to have been pretty keen; and there is a tolerably long list of members,—so that, on the whole, notwithstanding the low spirits of the Committee, the case of the Society is far from hopeless. But we trust the members will attend in larger numbers when the Society next goes to the Cefn Caves, Caergwle, or Humphry Head, notwithstanding the long distances. They will thereby not only add to their own enjoyment and instruction, but will bring relief to the minds of their depressed and anxious Committee.

THE greatest balloon in the world has been lately constructed at San Francisco by a Mr. van Tassel. It will hold 150,000 cubic feet of gas, and has been made for the purpose of traversing the American Continent from ocean to ocean. From the bottom of the car to the top of the inflated balloon will be 119 feet, and when filled the diameter will be 68 feet. The car is 21 feet in circumference and has sides 34 inches high; 15 persons can be seated in it.

FOR several years attempts have been made in Sweden to extract tannic matter from the Swedish species of pine, similar in quality, &c., to that of the American hemlock (*Pinus canadensis*), but without satisfactory results, chiefly on account of the manner in which this is done not being known. Now, however, the question has been solved by a chemist, Dr. Laudin, who, having visited North America for this purpose, has, on his return to Sweden, succeeded in producing tannic matter by a chemical process, which has been found equal to the American, though the colour of the Swedish leather produced therewith is more yellow in colour than the American. It is hoped that this discovery will have the effect of causing a great tanning industry to spring up in Sweden.

THE additions to the Zoological Society's Gardens during the past week include a Guinea Baboon (*Cynocephalus sphinx*), from West Africa, presented by Mr. C. Palgrave, F.Z.S.; an Alpine Marmot (*Arctomys marmotta*), two Tawny Owls (*Syrnium aluco*), European, presented by Mr. Lionel H. Hanbury, F.Z.S.; a Bank Vole (*Arvicola pratensis*), British, presented by Mr. G. T. Rope; two Derbian Screamers (*Chauna derbiana*) from the North Coast of Columbia, presented by Capt. H. Rigaud; a Peregrine Falcon (*Fulco peregrinus*), European, presented by Mr. J. Howard; a Golden-crowned Conure (*Conurus aureus*) from South-East Brazil, deposited; three Long-fronted Gerbilles (*Gerbillus longifrons*), eight Elliot's Pheasants (*Phasianus ellioti*), bred in the Gardens.

## ASTRONOMICAL PHENOMENA FOR THE WEEK 1886 AUGUST 22-28

(FOR the reckoning of time the civil day, commencing at Greenwich mean midnight, counting the hours on to 24, is here employed.)

At Greenwich on August 22

Sun rises, 4*h.* 58*m.*; souths, 12*h.* 2*m.* 42'<sup>23</sup>; sets, 19*h.* 7*m.*; decl. on meridian, 11° 44' N.: Sidereal Time at Sunset, 17*h.* 11*m.*

Moon (at Last Quarter) rises, 22*h.* 6*m.*\*; souths, 5*h.* 21*m.*; sets, 12*h.* 46*m.*; decl. on meridian, 13° 18' N.

Planet	Rises h. m.	Souths h. m.	Sets h. m.	Decl. on meridian
Mercury	4 13	11 19	18 25	12° 1' N.
Venus	2 28	10 19	18 10	19 43 N.
Mars	10 47	15 49	20 51	12 3 S.
Jupiter	8 25	14 22	20 19	1 27 S.
Saturn	1 11	9 16	17 21	21 53 N.

\* Indicates that the rising is that of the preceding evening.

Occlusions of Stars by the Moon (visible at Greenwich)

Aug.	Star	Mag.	Disap.	Reap.	Corresponding angles from vertex to right for inverted image
23	48 Tauri	6	1 23	1 54	126° 186'
23	7 Tauri	4	3 22	4 13	118 215
23	58 Tauri	6	4 1	near approach	348 —
Aug.	h.				
22	12				Jupiter at greatest distance from the Sun.
25	11				Mercury stationary.
27	20				Venus in conjunction with and 3° 0' north of the Moon.

### Variable Stars

Star	R.A.	Decl.	h. m.
U Cephei	0 52' 2	81° 16' N.	Aug. 22, 21 8 <i>m</i>
Algol	3 0' 8	40 31 N.	" 27, 20 47 <i>m</i>
V Tauri	4 45' 4	17 21 N.	" 22, 21 7 <i>m</i>
W Virginis	13 20' 2	2 47 S.	" 27, <i>M</i>
U Coronæ	15 13' 6	32 4 N.	" 26, 0 0 <i>m</i>
			" 22, 0 4 <i>m</i>
			" 28, 21 46 <i>m</i>
U Herculis	16 20' 8	19 9 N.	" 24, <i>M</i>
R Draconis	16 32' 4	67 3 N.	" 26, <i>M</i>
U Ophiuchi	17 10' 8	1 20 N.	" 22, 23 50 <i>m</i>
			and at intervals of 20 8
β Lyrae	18 45' 9	33 14 N.	Aug. 24, 2 0 <i>M</i>
R Lyrae	18 51' 9	43 48 N.	" 28, <i>M</i>
δ Cephei	22 24' 9	57 50 N.	" 27, 2 0 <i>M</i>

*M* signifies maximum; *m* minimum.

### Meteor Showers

Meteors have been observed at this time of the year from near α Ceti, R.A. 53°, Decl. 0; near Castor, R.A. 110°, Decl. 32° N.; near ζ Draconis, R.A. 260°, Decl. 64° N.; and from near α Draconis, R.A. 282°, Decl. 57° N.

## GEOGRAPHICAL NOTES

WE have before us Nos. 5, 6, 7, and 8 of *Petermann's Mittheilungen* for the present year, and Supplement No. 82. The last is a detailed account, by the late Herr Robert Schlagintweit, of the Pacific railways of North America. No. 5 contains a paper on the Xingu Expedition (concluded in No. 6), by Herr Claus, detailing the cartographical surveys and the physical and astronomical measurements made in the course of the explorations. The paper may be regarded as a supplement to the work of Dr. von den Steinen, "Durch Zentralbrasilien," lately published by Brockhaus. Dr. Oppel, in the same number, contributes a statistical paper showing the steady and enormous increase in the population of Europe. No. 7 contains two very interesting and original geographical papers—one by Herr Engelhard on the Island of Saleijer, a Dutch settlement in the Malay Archipelago, situated immediately south of Celebes. The island is described in an exhaustive way, its climate, people, situation, &c., being discussed in some detail. In the second